wherein the SMA material is configured to be placed in thermal communication with a hot region at a first temperature and with a cold region at a second temperature lower than the first temperature; and

wherein the SMA material is configured to selectively change crystallographic phase between martensite to austenite and thereby one of contract and expand in response to exposure to the first temperature and also to one of expand and contract in response to exposure to the second temperature, thereby converting a thermal energy gradient between the hot region and the cold region into mechanical energy.

14. The energy harvesting system of claim **13**, wherein the controller is configured to monitor a rotational speed of one of the first rotational pulley and second rotational pulley; and

wherein the controller is configured to decouple the electrical generator from the heat engine if the monitored rotational speed is below a predetermined threshold.

15. The energy harvesting system of claim **13**, wherein the coupling device includes an adaptive torque transmitting device having a variable gear ratio.

16. The energy harvesting system of claim **15**, wherein the controller is configured to monitor a temperature of the SMA material; and

wherein the controller is configured to increase the gear ratio of the adaptive torque transmitting device if the temperature of the SMA material exceeds a predetermined threshold.

17. The energy harvesting system of claim **13**, wherein the coupling device includes a clutch.

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